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that, for scientific people at least, the central fact of organic evolution had been established beyond question. In opposition to this view, we have a book of nearly 400 pages, by Prof. Alfred Fairhurst,¹ who has been "for many years a teacher of various branches of natural science." We doubt, however, whether his arguments will be found convincing by many who have paid very much attention to the biological sciences. The object of the book is "to promote the belief in Theism and in the existence of a spiritual nature in man which Theism alone can explain." Therefore, the author attacks evolution, not because Theism and the doctrine of evolution are necessarily antagonistic, — the author does not think that they are, — but because the belief in Theism in some people has been decreased by the propagation of the theory of evolution.

The difficulties that the author arrays against evolution are the old familiar ones: the origin of living material, the survival of primitive types, divergent evolution, absence of "missing links," the appearance of highly organized forms in early fossiliferous rocks, uselessness of nascent organs, instinct, and the like. He does not attach much weight to the evidence from homologies and vestigial organs. For example, "they (fins) are said to be homologous to the limbs of higher vertebrates, but I regard the homology as far-fetched." Again, "embryo man with gill arches is still man, and if we can read the lesson within it, we will find that this embryo man points upward to adult man with all of his marvelous powers of mind, and not downward to something infinitely below him."

To properly answer arguments presented from the point of view of this book, one would have to preface his remarks by a treatise on elementary biology, comparative anatomy, and embryology, and introduce a chapter on the natural history of animals and plants, with remarks on fossilization. The limits of a review will hardly permit this.

R. P. B.

Fusion of Pupæ.—In the Woods Holl Lectures for 1896 and 1897,² Henry E. Crampton, Jr., gives an interesting account of his experiments upon the pupæ of Lepidoptera. By cutting away portions of two pupæ, and joining the cut surfaces, he was able in many

¹ Fairhurst, Alfred. *Organic Evolution Considered*. St. Louis, Christian Pub. Co., 1897. 8vo., 386 pp.

² Crampton, Henry E., Jr. *Coalescence Experiments upon the Lepidoptera, Biological Lectures delivered at the Marine Biological Laboratory of Woods Holl*. Boston, Ginn & Company, 1898. pp. 219–228.

cases to obtain a firm union, and in due time a compound imago would emerge, generally with the help of the operator, however.

All attempts to join lateral halves of two different pupæ were unsuccessful, and the proportion of failures was large in all the series, but there were enough successful cases to give some interesting results.

It was found to be a little more difficult to unite pupæ belonging to different species or genera, than where the two components belong to the same species. Thus, of the former category only 7 cases out of 62 resulted favorably, while 14 out of 95 were successful of the latter. In regard to the way in which the parts were united, — in cases of union in normal proportion the successes were 4 out of 61, in “tandems” they were 3 out of 27, and in twins, *i.e.*, union of homologous parts, back to back, etc., they were 14 out of 69, over 20 per cent.

The results in regard to reciprocal color effects were inconclusive, and we still await the histological details.

R. P. B.

ZOOLOGY.

The Fresh-Water Fauna of Ceylon.¹—Seven collections in five localities in the swamps and lakes of Ceylon have afforded Dr. E. von Daday the opportunity of increasing the list of the known micro-fauna of this island from 42 to 170 species, 39 of which he describes as new. The 31 Protozoa observed in the collections or raised from dried moss are mainly cosmopolites, as are also the 42 species of Rotifera. Among the Entomostraca the Cyclopidae alone are represented by cosmopolitan species, while the Cladocera have a smaller ratio of such forms mingled with others having an Oriental, Ethiopian, or Australian distribution. The Centropagidae and Ostracoda are represented exclusively by species confined to the three regions named. This examination of the micro-fauna indicates that Ceylon is a meeting ground for the Palæarctic, Oriental, Ethiopian, and Australian types of minute life.

C. A. K.

Butler's Birds of Indiana.—For a number of years Mr. Amos W. Butler has been a diligent and intelligent student of the higher verte-

¹ Daday, E. Von. Mikroskopische Süßwasserthiere aus Ceylon, *Termes. Füzetek*, Bd. xxi, Anhangsheft. Budapest, 1898. 123 pp., 85 illustrations.